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RESEARCH ARTICLE
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DETERMINATION OF SITE OF LESIONS IN PAKISTANI ORAL SQUAMOUS CELL CARCINOMA PATIENTS

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ABSTRACT

Background: OSCC is the second most widespread cancer in Asia. The COE is considered the most reliable method for detecting oral lesions that may contain OSCC or dysplasia at an early stage, when they are most treatable.

Objective: To identify the location of lesions in both males and females in order to enhance the detection of safe boundaries for oral squamous cell carcinoma in patients.

Methodology: This cross-sectional study was conducted over 6-month periods at Department of Oral And Maxillofacial Surgery University College of medicine and dentistry, The University of Lahore from Jan 2021 to June 2021. An approach of non-probability sampling was used to collect the data. The average age of the patients was 52.2 years, ranging from 25 to 88 years. Total 50 patients were enrolled. In this study, males made up 31 (62%) while females made up 19 (38%). Appropriate preoperative preparation was carried out after informed consent. The research comprised instances of oral squamous cell carcinoma that were confirmed by biopsy. Male and female patients had mean ages of 50.2 and 52.4 years, respectively. The buccal mucosa (n = 20) was the most often occurring location in both genders, followed by the tongue, observed in 12 cases, and the lower vestibule, observed in 9 cases. The fewer common places included the maxillary sinus (n=2), upper vestibule (n=4), and lip (n=3).

Conclusion: The findings reflect the epidemiological presence of OSCC and have highlighted prominence in the site of lesions in both genders OSCC-affected patients.

KEYWORDS: Oral squamous cell carcinoma, Safe margins, involved margins, diagnostic adjuncts, diagnostic accuracy, dysplastic epithelium, malignant tissue

INTRODUCTION

OSCC is a cancerous condition affecting the mucous membrane of the mouth, characterized by the excessive and uncontrolled growth of cells in the mucosa.[1] The countries of Southeast Asia, including Bangladesh, India, Nepal, and Pakistan, are considered to have high-risk populations for oral malignancies.[2] The World Health Organization has identified a potential for the widespread outbreak of OSSC in this area.[1, 3] Mucosal squamous cell carcinoma is the most prevalent type of oral cavity cancer, accounting for 90% of cases.[2] The mean age of occurrence of OSCC is 3rd and 4th decade of life. The overall gender ratio is 3 males to 1 female, it is more prevalent in the male population.[4, 5] Pre-existing oral cavity diseases and disorders are the root cause of many OSCCs. Palatal lesion of reverse cigar smoking, discoid lupus erythematosus, erythrolein, leukoplakia, oral submucous fibrosis, and hereditary illnesses such as epidermolysis bullosa and dyskeratosis congenita are examples of premalignant lesions.[6, 7] The stage of the disease at diagnosis has an inverse relationship with the prognosis of cancer therapy. Even with improvements in early diagnostic techniques, tiny lesions are frequently overlooked. Because of this, 60% of lesions are significantly advanced when they are identified.[8, 9]

In Pakistan, the highly prevalent type of cancer of the neck and head region is squamous cell carcinoma.[10] Cancer registry data shows it as the second most prevalent malignancy in either gender, after breast cancers in females and prostate cancer in males.[11, 12] Mean age of presentation in males is 4th and 5th decades of life, but increases in the incidence, especially of OSCC of oral tongue among younger patients have been reported worldwide.[13] The growth and differentiation of epithelium in the oral cavity is regulated by multiple environmental and genetic factors. Alteration in these factors results in alteration like epithelium. This can manifest as epithelial dysplasia or metaplasia. In addition, the underlying connective tissue has a major impact in epithelial differentiation.[14] The epithelium's terminal differentiation is altered, but the basic architecture is maintained for example conversion of a stratified columnar epithelium into stratified squamous epithelium. On the other hand, when mitotic activity is seen in the suprabasal layers, and there is considerable variability in nuclear and cellular morphology, referred to as dysplasia.[15]

The oropharynx and oral cavity are distinct anatomical areas that do not overlap but rather border one another. The buccal mucosa, labial mucosa, alveolar ridge, floor of the mouth, hard palate, gingiva, anterior two-thirds of the tongue (posterior to the circumvallate papillae), and retromolar trigone are among the anatomic subsites of the oral cavity. The palatine tonsils, base of the tongue (posterior third), the soft palate, palatoglossal folds, valleculae, and posterior pharyngeal wall make up the oropharynx. The two locations are distinguished anatomically by the confluence of the hard and soft palate on the upper side and the circumvallate papillae on the lower side.[16] About 40% of cases in the oral cavity occur in the tongue, making it the most prevalent location for intraoral carcinoma. The tongue's ventral and posterior lateral borders are where these tumors most usually appear. The bottom of the mouth is the second most frequently observed intraoral site. The labial mucosa, gingiva, buccal mucosa and hard palate are often less affected areas.[17, 18] The oral mucosa's horseshoe-shaped portion, which includes lateral tongue and the floor of the mouth, is the most vulnerable to the development of cancer. This region's increased risk can be attributed to two main factors: First, any chemicals that cause cancer will react with saliva, gather at the base of the mouth, and keep filling these spaces with constant exposure then, the mucosa covering certain areas of the mouth is thinner and less keratinized, meaning it offers less defense against carcinogens.[19] When examining the oral cavity, it is critical that the physician is aware of this high-risk area.

While many oral malignancies undergo premalignant phases, such as in situ carcinoma or dysplasia, others seem to develop from scratch without any indication of prior disease, either clinically or microscopically.[20] Invasive carcinomas are tumors that have progressed to the point where they can pierce connective tissue, the basement membrane, and the circulatory system. These tumors possess a biological edge due to molecular mutations in proteins and genes linked to extracellular matrix breakdown and cell migration. Changes in the phenotypic of cell adhesion molecules (such as tegrins and cadherins) cause cells to detach from their natural environment and lose their capacity to migrate.[21] This offers the building blocks for the growing tumor to invade, in conjunction with the

enzymatic breakdown of the connective tissue and basement membrane. Usually, the boundaries of dysplastic lesions in the oral mucosa are not well defined. Local recurrence occurs when these lesions cannot be removed. Thus, accurate tumor intraepithelial spread assessment and appropriate resection are crucial. Unfortunately, because many individuals wait till stage III or IV illness before seeking a diagnosis and treatment, there hasn't been much progress made in the early identification of oral cancer. Thus, public education programs must encourage people to avoid high-risk behavior and ask their doctors about routine mouth cancer screening exams to improve oral cancer survival.[22] The aim of the study was to identify the location of lesions in male and female patients with OSCC in Pakistan, in order to enhance the diagnosis of safe margins for this type of cancer.

METHODS

This cross-sectional study was conducted over 6-month periods at Department of Oral And Maxillofacial Surgery University College of medicine and dentistry, The University of Lahore from Jan 2021 to June 2021. Inclusion criteria were Biopsy-proven cases of oral SCC of any gender and age who were fit for surgical procedure and had a resectable tumor with no prior radio or chemotherapy history. Patients with recurrent OSCC lesions, OSCC lesions on the attached gingiva or hard palate, a history of thyrotoxicosis, and those who refused to be included were excluded from the research.

The study was undertaken with the previous endorsement of the department's ethics committee. Patients were given general anesthesia to enable them for surgery. Patients' informed permission was obtained before they could be included in the research. Consultants determined the surgical treatment strategy based on a standard approach for each patient. Before being raised from the dead, the mouth cavity was carefully cleaned on the operating table using saline and 1% acetic acid, dried with cotton, and the locations of all lesions were precisely identified.

SPSS was used to enter and analyze all of the acquired data. Age-related quantitative data was shown as mean ± standard deviation. In terms of percentages and frequencies, qualitative characteristics such as gender and the safe boundaries of oral SCC were described.

RESULTS

The average age of the 50 patients was 52.2 ± 13.12 years. The age range of patients might vary from 25 to 88 years old. Male patients had a mean age of 52.0 ± 13.5 years, whereas mean age of female patients was 52.4 ± 12.6 years (Table 2). 62% of the patients were males and 38% were females, according to the gender distribution of the patients as shown in Pie chart (a). Compared to female patients, the majority of patients were male (Table 1). The lesion's location was also recorded. The buccal mucosa was the most often presented location (40%) and was followed by the lower vestibule (18%), tongue (24%), higher vestibule (8%) and lip (6%) as shown in Table 3 as well as Pie Chart B. The patients' gender was taken into consideration when observing the lesion site. Twelve male patients (38.7%) had lesions on their buccal mucosa, six (19%) on their lower vestibule, three (9.6%) on their upper vestibule, seven (22%) on their tongue, and one (3.2%) on their lip. By comparison, out of the female patients, 8 (42%) had an injury on the buccal mucosa, while 3 (15.7%) had an injury on the lower alveolus, 1 (5.2%) on the upper vestibule, and 5 (26%) on the tongue. Compared to other oral regions, it was shown that lesions were more common in the buccal mucosa in both male and female patients.

Table 1: Gender distribution of patients

Gender	Frequency	Percent
Male	31	62.0
Female	19	38.0
Total	50	100.0

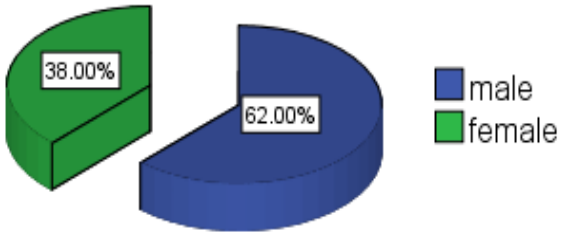

Figure 1: Gender Distribution Of Patients

Table 2: Descriptive Statistics For Age (Years)

Gender	Age			
	Mean	Std. Deviation	Minimum	Maximum
Male	52.06	13.58	25.00	88.00
Female	52.42	12.68	29.00	80.00
Total	52.20	13.12	25.00	88.00

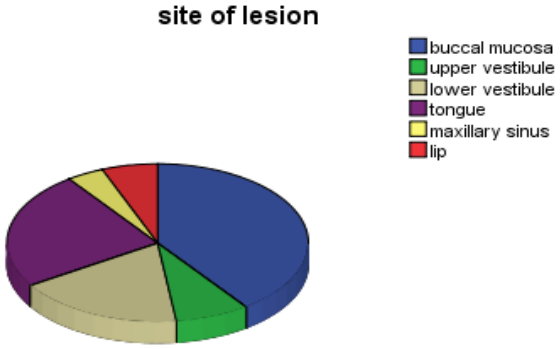

Figure: Distribution of Site of Lesion

Table 3: Distribution of site of lesion

Site of lesion	Frequency	Percent
Buccal mucosa	20	40.0
Upper vestibule	4	8.0
Lower vestibule	9	18.0
Tongue	12	24.0
Maxillary sinus	2	4.0
Lip	3	6.0
Total	50	100.0

Table-4: Site of lesions

Site of lesion	Male	Female	Total
Buccal mucosa	12	8	20
Upper vestibule	3	1	4
Lower vestibule	6	3	9
Tongue	7	5	12
Maxillary sinus	2	0	2
Lip	1	2	3
Total	31	19	50

Table 5: Distribution of Site of Lesion in Relation to Gender of Patients: A Cross Tabulation of Lesion Sites Among Male and Female Patients.

Site of lesion	Male	Female	Total
Buccal mucosa	12	8	20
Upper vestibule	3	1	4
Lower vestibule	6	3	9
Tongue	7	5	12
Maxillary sinus	2	0	2
Lip	1	2	3
Total	31	19	50

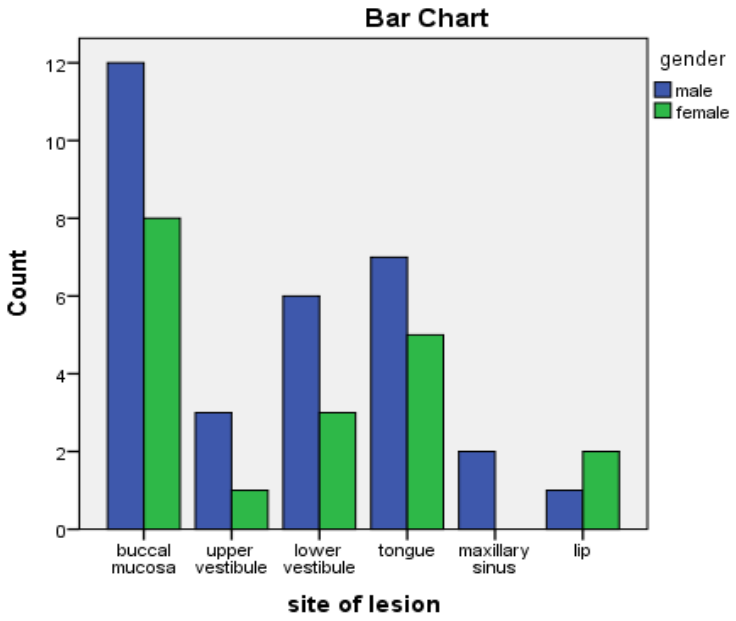

Figure 3: Site of occurrence in relation to gender

DISCUSSION

In this study, oral squamous cell carcinoma detection locations in both genders are reported. This study included patients with biopsy-proven OSCC lesions, as did Elimairi et al. in their analysis of 28 patients with a 60% conclusive diagnosis.[23] 52.2 ± 13.1 years was the mean age of the population of the study. The age range of patients might vary from 25 to 88, depending on the circumstances. The number of male patients exceeded the number of female patients with a ratio of 1.6:3. The mean ages of the male patients were 52.06 ± 13.58 and female patients were 52.42 ± 12.68 years. This is similar to a 2012 study by McMahona et al. that found a similar gender distribution among OSCC patients.[24] On the other hand, in our findings, the buccal mucosa is described as the most prevalent site of involvement in men 38% and in women 42%. The floor of the mouth was the most frequent site of occurrence in their investigation, with a total of 37 cases. In addition, when comparing our study (with a sample size of 20), McMahona et al. found a relatively small number of cases of oral squamous cell carcinoma (OSCC) in the buccal mucosa (with a sample size of 2). This is explained by the close contact between the buccal mucosa and the OSCC predisposing factors— paan, betal, and niswar in our area.

Asymptomatic and sometimes undetectable, precancerous lesions are often associated with early oral cancers. Thus, the physician must maintain a high index of suspicion, particularly in the occurrence of risk factors like tobacco or alcohol misuse. Oral mucosal premalignant changes that are clinically discernible often occur before invasive oral squamous cell carcinoma. Frequently, erythroplakia and leukoplakia manifest as either white or red spots. The patient may become aware of a non-healing ulcer as the malignancy spreads. Symptoms of a later stage include odynophagia,

dysphagia, dysarthria, trouble wearing dentures, growth of a mass in the neck and loosening of teeth.[21]

There is a strong association between the site of oral leukoplakia and the likelihood that a biopsy would reveal dysplastic or malignant alterations. In the Waldron and Shafer research, it was shown that the floor of the mouth was the most vulnerable area, with 42.9% of leukoplakias showing signs of epithelial dysplasia, in situ carcinoma, or undiscovered invasive squamous cell carcinoma. Additionally, the tongue and lip were shown to be high-risk areas as 24.2% dysplasia and 24.0% carcinoma were found among these patients. [20]

A study conducted to evaluate gender disparities and risk for oral cancer found that women who smoke had a higher susceptibility to the disease compared to men who smoke. Comparatively speaking to males, women who drink alcohol and smoke have a higher chance of having mouth cancer. The risk of oral cancer in elderly women is further increased by hormonal fluctuations and dietary deficits in iron, riboflavin, vitamins, and minerals. According to Taiwanese research, age at diagnosis, tumor anatomic location, smoking habit, eating betel nuts, and alcohol use showed significant gender differences ($p < 0.001$). The other clinical and pathological features, as well as the survival circumstances, did not significantly change according to gender.[25]

Detecting oral lesions enables the early identification of problems that may be precancerous or cancerous. To improve patient outcomes and ensure successful treatment, early diagnosis is essential. Researchers can learn more about possible variations in the location, features, or prevalence of oral lesions between males and females by examining lesions in both genders. This knowledge can result in customized treatment plans and preventative measures. Furthermore, examining the locations of lesions in both sexes might shed light on shared risk factors for the development of oral cancer, including alcohol and tobacco use, viral infections (including the human papillomavirus), genetic predispositions, and viral infections.

CONCLUSION

The initial stages in preventive and diagnostic anticipation are the identification of locally promoted chronic inflammation and possibly malignant lesions of the oral mucosa. As such, each lesion has to be identified quickly and given the proper care. Up to 99% of oral cancers and pre-malignancies can be found by the clinical identification and assessment of mucosal lesions in the mouth. The goal of the scientific community's ongoing efforts to prevent oral cancer and improve screening protocols is to identify the disease early enough to save lives by minimizing the diagnostic delay. To determine the possibility and/or existence of malignant transformation of the oral mucosa in both genders, further study is still needed to analyze and increase the detection of lesions at various places.

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